

Claims

What is claimed is:

1. A node incorporating hybrid radio frequency and optical wireless communication links, the node comprising:

- a. at least one laser portion for transmitting data;
- b. at least one radio frequency portion for transmitting data;
- c. a data receiver for receiving data from a data source; and
- d. a controller configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion.

2. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 1, wherein the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion.

3. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 2, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

4. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in

claim 1, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

5. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 1, wherein the laser portion is configured to both transmit and receive and wherein the radio frequency portion is configured to both transmit and receive.

6. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

7. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 6, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

8. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the controller is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion and the radio frequency portion.

9. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in

claim 5, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

10. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the laser portion and the radio frequency portion have transmit and receive strengths, and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

11. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the controller includes a plurality of latches and a logic device, wherein the plurality of latches and the logic device operate to provide adjustment levels for the portions of the data to be transmitted through the laser portion and the radio frequency portion.

12. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 11, wherein the laser portion and the radio frequency portion have aggregate transmit and receive strengths, and wherein the controller is configured to monitor the aggregate transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

13. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 11, wherein the laser portion and the radio frequency portion are configured to transmit in multiple channels.

14. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 13, wherein the each channel has a transmit and receive strength, and wherein the controller is configured to monitor the transmit and receive strength of each channel, wherein the channels of the data to be transmitted through the laser portion and the radio frequency portion are determined by the controller based on their transmit and receive strengths.

15. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 5, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

16. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 15, wherein the laser portion and the radio frequency portion are configured to transmit and receive in multiple channels.

17. A node incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 15, wherein an optical reflector is used to deflect transmissions from the laser portion in order to work around fixed objects in the environment, whereby the node

may be used to extend a network and the laser portion can maintain communication without the need for a strict line-of-site connection.

18. A network incorporating hybrid radio frequency and optical wireless communication links, said network comprising a plurality of nodes, each node including:

- a. at least one laser portion for transmitting data;
- b. at least one radio frequency portion for transmitting data;

- c. a data receiver for receiving data from a data source; and

- d. a controller configured to receive data from a data source and connected with the laser portion and the radio frequency portion to allocate portions of the data to be transmitted through the laser portion and the radio frequency portion.

19. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the controller of each node is configured as a binary switch such that the data is transmitted exclusively through either one of the laser portion or the radio frequency portion.

20. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 19, wherein the controller of each node is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

21. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the controller is configured to receive environmental information, and wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on the environmental information.

22. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the laser portion and the radio frequency portion of each node have transmit and receive strengths, and wherein the controller is configured to monitor the transmit and receive strengths, wherein the portions of the data to be transmitted through the laser portion and the radio frequency portion are adjusted by the controller based on their transmit and receive strengths.

23. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the laser portion and the radio frequency portion of each node are configured to transmit in multiple channels.

24. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 18, wherein the at least one laser portion and the at least one radio frequency portion are configured to transmit and receive in tandem, whereby the node may be configured to provide a hybrid serial link to permit tailored radio frequency or optical network connections.

25. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in

claim 18, wherein at least a portion of the network is configured with a ring topology.

26. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 25, wherein at least a portion of the network is configured as a SONET ring.

27. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 23, wherein at least a portion of the network is configured with a ring topology.

28. A network incorporating hybrid radio frequency and optical wireless communication links as set forth in claim 27, wherein at least a portion of the network is configured as a SONET ring.